CLAIMS:

1. A method of forming an electrochemical cell, the method comprising:

(a) forming a positive pole layer, comprising the steps of :

(i) printing a layer of positive pole powder onto a first substrate; and

(ii) printing a layer of electrolyte on said layer of positive pole powder, wherein said electrolyte comprises a self-forming separator layer ingredient;

(b) forming a negative pole layer, comprising the steps of:

(i) printing a layer of negative pole powder onto a second substrate; and

(ii) printing a layer of electrolyte on said layer of negative pole powder, wherein said electrolyte comprises a self-forming separator layer ingredient; and

(c) contacting said first substrate and said second substrate readily facilitating interaction between said self-forming separator layer ingredients in said positive pole layer and said negative pole layer to self-form an interfacial separator layer between said negative pole layer and said positive pole layer.

2. The method of claim 1, further comprising the step of printing an ink prior to step (a) onto at least one of inner sides of first and second substrates, said ink being a current conductor.

3. The method of claim 1, further comprising the step of printing a sealing ingredient, wherein the sealing ingredient is printed onto the substrate of one of the group consisting of the positive pole layer, negative pole layer and positive pole layer and negative pole layer.

4. The method of claim 3, wherein said sealing ingredient is selected from the group consisting of a glue, pressure sensitive glue, heat sensitive glue, an adhesive, a melting material, an ultrasonic welding material, hot melt polymer and combination thereof.

5. A method of forming an electrochemical cell, the method comprising:

(a) forming a positive pole layer, comprising the steps of :

(i) printing a layer of positive pole powder onto a first substrate; and

(ii) printing a layer of electrolyte on said layer of positive pole powder,

wherein said electrolyte comprises a self-forming separator layer ingredient;

(b) forming a negative pole layer, comprising the steps of:

(i) printing a layer of negative pole powder onto a second substrate; and

(ii) printing a layer of electrolyte on said layer of negative pole powder, wherein said electrolyte comprises a self-forming separator layer ingredient; and

(c) contacting said first substrate and said second substrate with a thin layer interposed between said positive pole layer and said negative pole layer, wherein said thin layer comprises a self-forming separator layer ingredient, readily facilitating interaction between said self-forming separator layer ingredients in said positive pole layer and said negative pole layer with said self-forming separator layer ingredient in said thin layer to self-form an interfacial separator layer between said negative pole layer and said positive pole layer.

6. The method of claim 5, wherein said thin layer is disposed on said positive pole layer and then said negative pole layer is applied onto said thin layer.

7. The method of claim 5, wherein said positive pole layer and said negative pole layer are applied simultaneously onto said thin layer.

8. The method of claim 7, wherein said application is by a printing technique.

9. The method of claim 5, further comprising the step of printing a sealing ingredient, wherein the sealant ingredient is printed onto the substrate of one of the group consisting of positive pole layer, negative pole layer and positive pole layer and negative pole layer..

10. The method of claim 9, wherein said sealing ingredient is selected from the group consisting of a glue, pressure sensitive glue, heat sensitive glue, an adhesive, a melting material, an ultrasonic welding material, hot melt polymer and combination thereof.

11. The method of claim 5, wherein said thin layer is a solution.

12. The method of claim 5, wherein said interfacial separator layer is formed as one of the group selected from a gel, a polymer precipitate, a membrane, a polymeric membrane, a solid membrane, a gelled membrane, a gelled precipitate or a combination thereof.

13. A method of forming an electrochemical cell, the method comprising:

(a) forming a positive pole layer, comprising the steps of :

(i) applying a layer of positive pole powder onto a first substrate; and

(ii) applying a layer of electrolyte on said layer of positive pole powder, wherein said electrolyte comprises a self-forming separator layer ingredient;

(b) forming a negative pole layer, comprising the steps of:

(i) applying a layer of negative pole powder onto a second substrate; and

(ii) applying a layer of electrolyte on said layer of negative pole powder, wherein said electrolyte comprises a self-forming separator layer ingredient; and

(c) contacting said first substrate and said second substrate readily facilitating interaction between said self-forming separator layer ingredients in said positive pole layer and said negative pole layer to self-form an interfacial separator layer between said negative pole layer and said positive pole layer.

14. The method of claim 13, wherein said applying is done by a technique selected from the group consisting of printing, spraying, coating and dispensing and a combination thereof.

15. The method of claim 13, wherein said interfacial separator layer is formed as one of the group selected from a gel, a polymer precipitate, a membrane, a polymeric membrane, a solid membrane, a gelled membrane, a gelled precipitate or a combination thereof.

16. A method of forming an electrochemical cell, the method comprising:

(a) forming a positive pole layer, comprising the steps of :

(i) applying a layer of positive pole powder onto a first substrate; and

(ii) applying a layer of electrolyte on said layer of positive pole

powder, wherein said electrolyte comprises a self-forming separator layer ingredient;

(b) forming a negative pole layer, comprising the steps of:

(i) applying a layer of negative pole powder onto a second substrate; and

(ii) applying a layer of electrolyte on said layer of negative pole powder, wherein said electrolyte comprises a self-forming separator layer ingredient; and

(c) contacting said first substrate and said second substrate with a thin layer interposed between said positive pole layer and said negative pole layer, wherein said thin layer comprises a self-forming separator layer ingredient, readily facilitating interaction between said self-forming separator layer ingredients in said positive pole layer and said negative pole layer with said self-forming separator layer ingredient in said thin layer to self-form an interfacial separator layer between said negative pole layer and said positive pole layer.

17. The method of claim 16, wherein said applying is done by a technique selected from the group consisting of printing, spraying, coating and dispensing and a combination thereof.

18. The method of claim 16, wherein said interfacial separator layer is formed as one of the group selected from a gel, a polymer precipitate, a membrane, a polymeric membrane, a solid membrane, a gelled membrane, a gelled precipitate or a combination thereof.

19. A fully printed cell comprising:

(a) a positive pole layer comprising:

(i) a layer of positive pole printed on a first substrate; and

(ii) a layer of electrolyte printed on said layer of positive pole, wherein said electrolyte comprises a self-forming separator layer ingredient;

(b) a negative pole layer comprising:

(i) a layer of negative pole printed onto a second substrate; and

(ii) a layer of electrolyte printed on said layer of negative pole, wherein said electrolyte comprises a self-forming separator layer ingredient; and

(c) a self-formed interfacial separator, wherein said self-formed interfacial separator is disposed between said negative pole layer and said positive pole layer.

20. The fully printed cell of claim 19, wherein said self-formed separator is formed by contacting said first substrate and said second substrate readily facilitating interaction between said self-forming separator layer ingredients in said positive pole layer and said negative pole layer to self-form an interfacial separator layer between said negative pole layer and said positive pole layer.

21. The fully printed cell of claim 19, further comprising at least one current conductor.

22. The fully printed cell of claim 19, wherein said self-formed interfacial separator layer is formed as one of the group selected from a gel, a polymer precipitate, a membrane, a polymeric membrane, a solid membrane, a gelled membrane, a gelled precipitate or a combination thereof.

23. A method of forming a coplanar electrochemical cell, the method comprising:

(a) applying a layer of positive pole powder onto a first substrate;

(b) applying a layer of negative pole powder onto first substrate in spaced relation and in the same plane as the positive pole powder;

(c) applying a layer of electrolyte on and between said layer of negative pole and said layer of positive pole, wherein said electrolyte comprises at least one self-forming separator layer ingredient;

(d) applying a layer of electrolyte on a second substrate, wherein said electrolyte comprises at least one self-forming separator layer ingredient;

(e) contacting said first substrate and said second substrate readily facilitating interaction between said self-forming separator layer ingredients in said first substrate and said second substrate layers to self-form an interfacial separator layer.

24. The method of claim 23, wherein said applying is done by a technique selected from the group consisting of printing, spraying, coating and dispensing and a combination thereof.